Union of Concerned Scientists

Citizens and Scientists for Environmental Solutions

August 22, 2003

John W. Thompson, IV
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: COMMENTS ON THE MITIGATING SYSTEMS PERFORMANCE INDEX (MSPI)

Dear Mr. Thompson:

The public meetings on July 23rd and August 21st provided me a reasonable understanding of the mitigating systems performance index (MSPI) being contemplated as a replacement for the current safety system unavailability indicator within the reactor oversight process (ROP). The MSPI certainly has some features that make it attractive. However, it also carries some problems. The Union of Concerned Scientists believes that in its present form, the net affect of the MSPI would be to reduce the effectiveness of the ROP. Therefore, we urge the NRC not to swap indicators until after enough of the MSPI problems are corrected such that it won't do more harm than good.

The best feature of the MSPI is that it accounts for both the unavailability and the unreliability of safety systems. In addition, the MSPI better accounts for support systems needed by the safety systems (i.e., cooling water systems). These are pluses that make the MSPI attractive.

Unfortunately, these attractive pluses are currently bundled in an extremely ugly package. The absolute worst feature of the MSPI is its heavy reliance on plant-specific probabilistic risk assessments (PRAs) of unknown quality. This problem is a show-stopper from our perspective. We wholeheartedly agree with the notion expressed by some NRC staffers and industry representatives during the August 21st meeting that MSPI did not create the PRA quality issue. But as long as the NRC dodges resolving the PRA quality issue and permits activities like MSPI to proceed anyway, the PRA quality issue will never get resolved. It's analogous to the "operator workarounds" at many nuclear plants that the NRC frowned up in the mid 1990s. The NRC was properly concerned then that operators should not be unduly burdened with actions to compensate for impaired equipment. The NRC's attention prompted plant owners to effect repairs in timely manner. The NRC now needs to abide by its own missives and stop allowing MSPI et al to "workaround" the right thing. The NRC must resolve the PRA quality issue before adopting MSPI.

Contrary to assertions by industry representatives, the PRA quality issue is NOT the same for MSPI as it is for license amendment applications. If a plant owner opts to pursue a license amendment request based on PRA insights, information on PRA quality must be submitted on the docket and approved by the NRC. There is an opportunity for the public to review the amendment request and intervene if there are concerns about the PRA application to that case. It appears as though MSPI may be adopted with neither formal NRC approval of each plant owner's PRA quality nor opportunity for public intervention.

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Further justification for the need to resolve the PRA quality issue was revealed during Mr. Donald A. Dube's presentation at the August 21st meeting. Referring to the NRC's inspections during the pilot MSPI program, Mr. Dube commented (page 14 of his presentation slides):

- *"Expectation going into Pilot that SPAR models in good agreement with Plant PRAs.*
- *"High level" agreement [at the core damage frequency level during SPAR model revisions 1 and 2] not necessarily indicative of agreement for cut-sets at 1E-6/yr and lower.*
- *Importance measures of components monitored in MSPI often differed by one or two orders of magnitude, especially cooling water support systems.*
- *Major effort to enhance all 11 distinct SPAR models (20 nuclear units)."*

If I understand Mr. Dube's presentation correctly,[1] the SPAR models were developed and refined by the NRC staff by benchmarking them against plant-specific PRA core damage frequency results. However, in a sort of "end doesn't justify the means" thing, that benchmarking did not ensure alignment at the component level. Reconciling the component-level differences required changes to the SPAR models in many cases and to the PRAs in others, a "major effort" that consumed several weeks.[2] But the result was reported as being agreement within an order of magnitude.

If the NRC resolved the PRA quality issue and then conducted this component-level alignment – for at least all components with risk significance above a threshold – for all plants, the high resource expenditure would probably be repaid in short order by improved efficiency of many NRC processes. For example, it probably would not take untold person-decades for the NRC staff to churn through the Significance Determination Process (SDP) Phase 2 and Phase 3 steps IF its SPAR models matched PRAs at the component level to within an order of magnitude. The "one or two orders of magnitude" difference cited by Mr. Dube is most likely responsible for all the effort and iterations currently wasted on SDP Phase 2 and 3. Similar, or greater, resource savings could be realized by the NRC staff in processing risk-informed license amendment requests, deciding to approve Notices of Enforcement Discretion, etc. The NRC can fix PRA quality now or pay forever for not fixing it.

A related concern is the departure of MSPI from one of the very important foundations of ROP; namely, that the process be open, transparent, and scrutable. The NRC does not allow the public to review the Individual Plant Examinations submitted by plant owners circa 1992 in response to Generic Letter 88-20. The NRC does not allow the public to review the SPAR model information developed by the NRC staff for specific plants. It would be a premeditated, deliberate contravention of this basic founding ROP principle to adopt the MSPI with its heavy reliance on "secret" information. Until the issue of public access to risk information is resolved, the NRC should simply stay the course with its existing safety system unavailability indicator.

According to slide 22 of Mr. Dube's presentation on August 21st, a "Consolidated Data Entry program through INPO will consolidate and ease reporting." Undoubtedly. But will convenience be accompanied by accuracy? INPO is not an NRC licensee. INPO is not subject to 10 CFR 50.9 and 10 CFR 50.7. INPO is not inspected by NRC to verify that the information it receives by NRC licensees is faithfully collected, maintained, and redistributed. What assurance would the NRC have that the "consolidated" data from INPO is not inaccurate due to inadvertent or intentional means? Absolutely none. Should NRC's MSPI rely on plant data from INPO? Absolutely not.

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[1] Mr. Dube has contended I did not understand parts of his presentation during the July 23, 2003, meeting on the MSPI. There was not a written test following the August 21st meeting, so I'm unable to independently gauge my comprehensive of his recent presentation.

[2] Note that the "major effort" was confined to only few plants in the MSPI Pilot Program. The remaining PRAs lack even that limited verification.

The UCS wonders why senior managers in the nuclear industry haven't raised concerns about the unintended consequences of the MSPI on their staffs, as some did regarding the inclusion of manual scrams in the original performance indicator. Their concern then was that control room operators might not manually scram the reactor when plant conditions warranted it because of a fear that it would cross the GREEN/WHITE threshold on the performance indicator. Where is their concern now about control room supervisors not permitting equipment to be tagged out for maintenance because of a fear that the increased unavailability would cause MSPI to cross the GREEN/WHITE threshold? Or their concern now that maintenance and/or testing would be intentionally delayed until the next quarter – even via entry into the Technical Specification 3.0.5 grace period – so as to wait for three-year old data to fade away? It would be far, far easier to manipulate MSPI than the scram indicator. And, it would be far, far easier to manipulate MSPI than the existing safety system unavailability indicator, especially if the data is "laundered" through INPO.

It is very apparent that the Office of Research needs MSPI to be implemented to show some results for its efforts the past couple of years. They have done some very fine work, but MSPI is not ready for prime time. So, to help the Office of Research check off this item on its "To Do" list, I'd support keeping the current safety system unavailability indicator as-is but renaming it MSPI. That way, Research can chalk one up without the Reactor Oversight Process being compromised along the way.

Sincerely,

David Lochbaum
Nuclear Safety Engineer